

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows.

1. (Currently Amended) A method for improving the recovery efficiency of storing fresh water into an aquifer using a storage model of the aquifer, the storing comprising injecting the fresh water and extracting [[the]] injected fresh water by a single water storage system comprising at least one well penetrating the aquifer, the method comprising:

~~controlling~~ ~~providing~~ a plurality of screens, each of the plurality of screens ~~screen~~ being located alongside a wall of the at least one well, and each of the plurality of screens ~~screen~~ respectively allowing a flow of fresh water between an associated storage zone in contact with the screen and the at least one well on which the screen is located; [[and]]

determining, in the storage model, a behavior of each associated storage zone using a plurality of geological characteristics of the aquifer;

receiving data from a plurality of sensors, wherein each of the plurality of sensors measures and monitors a quality parameter of water at one of the plurality of screens;

determining that the quality parameter of water has reached a predetermined threshold using at least one sensor of the plurality of sensors;

using the storage model to simulate an interaction between the injected fresh water and native water from each associated storage zone using the behavior of each associated storage zone, the data received from the plurality of sensors, and the quality parameter that has reached the predetermined threshold;

~~controlling the flow of fresh water through each one of the plurality of screens according to parameters provided from a storage model of the aquifer, the storage model describing a behavior of each storage zone~~

determining, based on the interaction, that the flow of fresh water from one or more screens of the plurality of screens should be modified to maintain or improve produced water quality of the at least one well; and

adjusting the one or more screens to maintain or improve the produced water quality of the at least one well.

2. (Cancelled)

3. (Currently Amended) The method according to claim 1 ~~[[2]]~~, ~~further comprising: providing the plurality of screens, each screen being located alongside the wall of a single well wherein the single water storage system comprises only one well penetrating the aquifer.~~

4. (Currently Amended) The method according to claim 3, further comprising:
extracting the fresh water from the aquifer;
monitoring the quality parameter of the extracted fresh water at an exit of the single well;
following determining that the flow of fresh water from the one or more screens should be modified, selecting an ~~[[open]]~~ additional screen ~~following the triggering, wherein the [[open]] additional screen being located as is the deepest [[open]] screen alongside the single well allowing the flow of fresh water among all open screens of the plurality of screens;~~
closing the additional screen to stop ~~stopping~~ the flow of fresh water through the ~~selected open additional~~ screen.

5. (Cancelled)

6. (Currently Amended) The method according to claim 3, further comprising:
extracting the fresh water from the aquifer;
monitoring the quality parameter of the fresh water at each screen of the plurality of screens using the plurality of sensors;
following determining that the flow of fresh water from the one or more screens should be modified, selecting an ~~[[open]]~~ additional screen ~~following the triggering, wherein the [[selected]] additional screen corresponding corresponds to a location alongside the single well at which the quality parameter reaches the critical predetermined threshold value;~~

~~stopping~~ adjusting the additional screen to modify the flow of fresh water through the ~~selected open~~ additional screen.

7. (Currently Amended) The method according to claim 6, further comprising:

activating a closing mechanism at the ~~selected~~ additional screen ~~[[,]]~~ to stop the flow of fresh water through the ~~selected~~ additional screen.

8. (Currently Amended) The method according to claim 3, further comprising:

injecting the fresh water into the aquifer through ~~a first screen~~ the one or more screens, the one or more screens ~~first screen~~ being located as the deepest of the plurality of screens ~~screen~~ alongside the single well;

monitoring the quality parameter of liquid at an outside part of each screen of the plurality of screens distinct from the one or more screens ~~first screen~~, the outside part being in contact with a storage zone;

selecting ~~a second~~ an additional screen among the plurality of screens following identifying the ~~triggering~~ screen, the ~~second~~ additional screen being distinct from the one or more screens ~~first screen~~, and the ~~second~~ additional screen corresponding to a location alongside the single well at which the quality parameter reaches the predetermined threshold ~~critical value~~;

~~enabling~~ adjusting the additional screen to modify the flow of fresh water through the ~~second~~ additional screen.

9. (Currently Amended) The method according to claim 1 ~~[[2]]~~, further comprising:

providing the at least one ~~a main~~ well;

providing at least one peripheral well, the at least one peripheral well being distinct from the at least one ~~main~~ well;

providing at least one screen from the plurality of screens for respectively each one of the ~~main~~ at least one well and the at least one peripheral well ~~wells~~.

10. (Currently Amended) The method according to claim 9, further comprising:

injecting the fresh water into the aquifer through a screen located alongside the at least one ~~main~~ well;
monitoring the quality parameter of liquid at an outside part of each screen located on [[a]] the at least one peripheral well, the outside part of each screen being in contact with a storage zone;
following determining that the flow of fresh water from the one or more screens should be modified ~~the triggering~~, selecting [[a]] an additional screen at which the quality parameter reaches the predetermined threshold ~~critical value~~;
injecting the fresh water into the aquifer through the at least one peripheral well on which the ~~selected~~ additional screen is located.

11. (Currently Amended) The method according to claim [[2]] 1, wherein [[:]] the quality parameter is a total dissolved salt parameter.

12. - 22. (Cancelled)

23. (Currently Amended) The method according to claim 1 [[2]], further comprising:

injecting the fresh water into the aquifer;
extracting the fresh water from the aquifer;
the ~~selecting~~ determining that the flow of fresh water from the one or more screens of the plurality of screens should be modified and the ~~modifying~~ adjusting being performed such as to keep the quality parameter of the fresh water being extracted in a desired range;
interrupting the extracting of the fresh water [[if]] when the quality parameter is outside of the desired range.

24. (Original) The method according to claim 23, wherein the injecting, the extracting and the interrupting are repeated in at least one cycle following the interrupting.

25. (Currently Amended) The method according to claim 23, wherein the interrupting comprises selectively interrupting the extracting from one determined storage zone of the aquifer [[if]]

when the quality parameter from the fresh water extracted out of the determined storage zone is outside the desired range.

26. (Currently Amended) The method according to claim 3, wherein [[:]] the quality parameter is a total dissolved salt parameter.

27. (Currently Amended) The method according to claim 4, wherein [[:]] the quality parameter is a total dissolved salt parameter.

28. (Cancelled)

29. (Currently Amended) The method according to claim 6, wherein [[:]] the quality parameter is a total dissolved salt parameter.

30. (Currently Amended) The method according to claim 7, wherein [[:]] the quality parameter is a total dissolved salt parameter.

31. (Currently Amended) The method according to claim 8, wherein [[:]] the quality parameter is a total dissolved salt parameter.

32. (Currently Amended) The method according to claim 9, wherein [[:]] the quality parameter is a total dissolved salt parameter.

33. (Currently Amended) The method according to claim 10, wherein [[:]] the quality parameter is a total dissolved salt parameter.

34. (Cancelled)

35. (Cancelled)

36. (Currently Amended) The method according to claim 24, wherein the interrupting comprises selectively interrupting the extracting from one determined storage zone of the aquifer [[if]] when the quality parameter from the fresh water extracted out of the determined storage zone is outside the desired range.

37. (New) The method of claim 1 wherein adjusting the one or more screens is affected by changing a position of a seal inside the well in the proximity of the one or more screens.
38. (New) The method of claim 1 wherein adjusting the one or more screens is affected by changing a position of a plug inside the well in the proximity of the one or more screens.
39. (New) The method of claim 1 wherein adjusting the one or more screens is affected by changing a flow connection inside the well in the proximity of the one or more screens.